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ABSTRACT

This study sought to empirically identify subtype and severity patterns prevalent among learning-disabled adults and apply this information to strategies that rehabilitation counselors could use to improve the probability of job success of their clients. Subjects (n=219) were administered standardized measures of intelligence, achievement, and adaptive behavior. Subtype information was obtained from a subtype identifier and severity information from a severity identifier. Five dichotomous subtypes, which were distinctly different from one another, were identified. Severity represented a continuum, but could be arbitrarily divided into five levels to represent dichotomous groups. The subtypes were named Non-Learning Disabled, Production Deficit, Verbal Organizational Disorder, Nonverbal Organizational Disorder, and Global Functional Disorder. The severity levels were named mild, mild-to-moderate, moderate, moderate-to-severe, and severe. When characteristics of subtypes and severities were analyzed, severity levels were found within each subtype. Rehabilitation counselors can use subtype information to determine clusters of behaviors that are problematic and require further assessment or intervention. Severity information can be used to ascertain adaptive abilities and disabilities of clients and the extent to which a client must rely on other people to succeed in social and work settings. (JDD)

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INVESTIGATION OF SUBTYPES AND SEVERITIES OF LEARNING DISABLED ADULTS ©

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Problem and Objectives

As the field of vocational rehabilitation increases its emphases toward providing services to learning disabled adults, issues related to specific severities and subgroups of learning disabled individuals must be addressed. Without this information, rehabilitation counselors possess insufficient information to assess client strength and weakness patterns and use this information to assist clients in appropriate career planning and job placement. Until recently, little systematic research has been conducted to identify the characteristics of subtypes and severities within the learning disabled adult population. Although studies of subgroups have been conducted with elementary age students, studies that address the generalization of these findings to learning disabled adults have been unavailable. Empirical studies of severity levels within the population also have been absent. The purpose of the study was to empirically identify subtype and severity patterns prevalent among learning disabled adults and apply this information to strategies that rehabilitation counselors could use to improve the probability of job success of given severity levels and subtypes of learning disabled adults.

Methods

Two hundred nineteen subjects were administered standardized measures of intelligence, achievement, and adaptive behavior. Subtype information was obtained from a subtype identifier and severity information from a severity identifier. Data were subjected to nonparametric analyses of cluster solution, chi-square tests, and discriminant analyses. Standardized discriminant function coefficients, discriminant structure matrices, varimax rotated transformation matrices, group covariance matrices identified variables that loaded for different subtypes and severities. Discriminant scatterplots and discriminant classification results examined the separation of group centroids and evaluated the accuracy of group classification. Patterns of employment were examined for each subtype and severity.

Results and Conclusions

The results indicated that both subtypes and severities were present and identifiable among the learning disabled adult population. Five dichotomous subtypes that were distinctly different from one another were identified. Severity represented a continuum, but could be arbitrarily divided into five levels to represent dichotomous groups. Intelligence, achievement, and adaptive behavior instruments were used to examine differences among the groups. These results suggested that the adult learning disabled population must not be interpreted as a homogeneous group, but must be viewed as a heterogeneous population. The results also indicated that differential constructs, domains, and taxonomies could be established within the adult learning disabled population.

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Subtypes

Subtypes were identified using the Learning Disabilities Subtype Identifier. Five constructs emerged that described ways individuals perform tasks requiring higher order cognition; selective and sustained attention; linguistic application; organization of space and time; and social cognition. These constructs approximated the descriptions of subtypes provided by the vignettes of the subtype identifier. Therefore the name of each subtype was used to designate the following domains: Non-Learning Disabled (NLD); Production Deficit (PD); Verbal Organizational Disorder (VOD); Nonverbal Organizational Disorder (NVOD); and Global Functional Disorder (GFD). After analysis of these domains, it was concluded that two of the subtypes (NLD and PD) did not possess true learning disabilities, but that three (VOD, NVOD, & GFD) did. As a result, a decision was made to split the total sample into two groups for taxonomic analysis. One group would contain NLDs and PDs; the other VODs, NVODs, and GFDs.

NLD and PD Taxonomies: Standardized discriminant function coefficients, discriminant structure matrices, varimax rotated transformation matrices, and group covariance matrices were studied for the subtypes of NLD and PD. These studies revealed that the variables that loaded most strongly for the correct classification of these groups and those that related to one another closely were compatible (Wilks' Lambda = .0131; Chi Square = 97.511; sign., .0001). All variables were associated with intelligence, achievement, and adaptive behaviors and fell within the constructs of higher order cognition and selective and sustained attention. However, the specific variables associated with NLDs versus PDs differed widely.

Individuals of the Non-Learning Disabled subtype exhibited intelligence quotients that fell almost one standard deviation below the mean. Cluster and individual subtest scores from the achievement measure were also approximately one standard deviation below the mean. When intelligence was compared to achievement to derive the significant discrepancy required by PL 94-142 to qualify as learning disabled, no discrepancy was found. Although NLDs had been called learning disabled during their school years, they would not have been eligible if their intelligence instead of their grade placement had been used as the criterion for expectancy. Overall, the manifestations of their adaptive abilities were similar to those of individuals without learning disabilities. However, the pace of their adaptation appeared to be depressed in proportion to their level of intelligence. Although they exhibited difficulties with higher order cognition, often did not follow through on tasks, did not like school, needed demonstrations of how to do tasks, and possessed a shortage of problem solving strategies, these individuals usually engaged in routine work that was required of them, participated in groups if they are expected to, and completed tasks that were assigned.

Individuals of the Production Deficit subtype exhibited intelligence quotients that fell at or slightly above the mean. Their clusters and individual subtests from the achievement measure were at least one standard deviation below the mean. When intelligence was compared to achievement to derive discrepancy, a significant discrepancy between achievement and expectancy was indicated. Adaptively, the majority of their characteristics were equivalent to those of the normal population and they exhibited few

difficulties in linguistic application, organization of space and time, or social cognition. PDs encounter difficulties only with tasks that required sustained attention. They solved many problems through intuition and gut reaction rather than thinking through them to solution, evidenced difficulties producing work in large groups, grasped main ideas better than details, and tended to keep their workspaces inordinately messy and disorganized. Although they were energetic in doing their work, they worked in spurts and usually needed to repeat tasks to get them right. Perhaps this was because they attacked tasks they didn't understand before asking for help, even through they predicted the outcome would be incorrect. Overall it was evident that these individuals were probably not learning disabled by employment standards, but needed structured environments and supervision to work successfully.

VOD, NVOD, and GFD Taxonomies: Standardized discriminant function coefficients, discriminant structure matrices, varimax rotated transformation matrices, and group covariance matrices also were studied for the subtypes of VOD, NVOD, and GFD. These studies revealed that the variables that loaded most strongly for the correct classification of these groups and those that related to one another closely were compatible (Wilks' Lambda = .05357; Chi Square = 253.16; Sign = .0001). For these subtypes, individual adaptive behavior variables contributed significantly more to the taxonomy than did variables of intelligence or achievement.

Individuals of the Verbal Organization Disorder subtype evidenced difficulties in linguistic application. On the WAIS-R, VODs tended to score higher on subtests associated with Performance IQ than on those associated with Verbal IQ. On the Woodcock Johnson, their academic functioning was well below the mean. Although their low-level language functions (phonology, morphology, syntax, semantics) were adequate for adaptation, their difficulties organizing their language for pragmatic application was impaired. Individuals of this subtype understood and used nonverbal communication patterns well, but found it difficult to give straightforward and logical verbal explanations and follow instructions given orally. As a result, they preferred to engage in work that required minimal verbal interaction with others, could be demonstrated rather than discussed, and related more to mechanical and nonverbal tasks than to those that required communication skills. These adaptive behaviors were confirmed by the performance patterns from intellectual and achievement measures.

Individuals of the Nonverbal Organizational Disorder subtype evidenced difficulties with organization of space and time. On the WAIS-R, NVODs' scores were at or slightly above the norm and approximately equal for verbal and performance areas. On the Woodcock-Johnson they exhibited significant disabilities in achievement, particularly in the area of mathematics. Adaptively, perhaps their most interesting behavior was their lack of understanding of their own abilities. Although they thought they could do tasks required of them well, they usually could not. They tended to get lost easily, were frequently late to or absent from work, had difficulty switching from task to task, and frequently were disoriented. They usually did not follow through on tasks, were unaware when they have hurt other's feelings, and were rarely cognizant if others are being helpful, sarcastic, critical, or complimentary of the ways they conducted themselves and their work.

Individuals of the Global Functional Disorders subtype presented a clinically different picture from VODs and NVODs. The characteristic that contributed most significantly to the identification of GFDs was their individual patterns of strong and weak abilities. These patterns were inconsistent and lacked one-to-one correspondence between adaptive and maladaptive behaviors as well as between verbal and nonverbal abilities and disabilities. Often individuals of this subtype had one ability that implied facility with another. However, when this second ability was measured, it often was absent or severely underdeveloped. As a result, these individuals presented a flat profile on the WAIS-R and Woodcock Johnson. However, when the profile was critically analyzed, a totally uneven pattern of intellectual and skill development was shown. Adaptively, GFD individuals exhibited poor social cognition. They had difficulties understanding cause and effect, had poor comprehension and use of humor, and expended an inordinate amount of time preparing to do their work. They tended to use unusual problem solving strategies, talked aloud to themselves to clarify thoughts and solutions, and touched the part of their bodies with which they would be working before beginning work. Often they spoke or acted without thinking and incorrectly interpreted the feelings of others. However, they worked so hard to understand and complete tasks they were drained and exhausted when their work was finished.

Severities

Severities were identified using the eight components of the Severity Identifier and five different constructs determined. These constructs described the extent to which individuals relied on others to appropriately interact with their environments and were arranged along a continuum from lowest to highest. Individuals who relied little on others appeared somewhat unresponsive to other people. Those who relied on others a bit more, appeared to have a heightened sense of self, but exhibited a need to please others. Individuals who relied on others somewhat more tended to be dependent on others for guidance. Those who relied even more appeared to be dependent on others to make decisions for them. Individuals who relied on others the most tended to need input from others in almost every situation in which coping with the world was required. Because the constructs associated with severity were comparable to those specified in the identifier as well as by the field of special education, the names for each severity were selected as domains. These names were: Mild (Ml); Mild-to-Moderate (MM); Moderate (Mo); Moderate-to-Severe (MS); and Severe (S). After analysis of the domains, it was determined that degrees of severity constituted a continuum, but could be arbitrarily divided into groups on the basis of relevant variables. Therefore, these domains were subjected to taxonomic analysis.

Standardized discriminant function coefficients, discriminant structure matrices, varimax rotated transformation matrices, and group covariance matrices were studied for each severity. These studies revealed that the variables that loaded most strongly for the correct classification of each group were in the area of adaptive behavior and those that related to one another closely were compatible (Wilks' Lambda = .0353; Chi Square = 282.47; sign., .01).

Individuals with mild degrees of severity (Ml) rarely needed others to provide them with assistance to manage their personal environments, but did

need assistance in jobs. These individuals expressed themselves equally well or poorly with peers and supervisors, had equal recall of main ideas and details, and evidenced little fantasy in their lives. Although they had one major problem solving strategy which they used most frequently and expended a great deal of energy avoiding tasks in which they would not succeed, their overall adaptivity was similar to that of normal-nonhandicapped persons.

Individuals with mild-to-moderate degrees of severity (MM) relied on others a little in both personal and job related environments. Prone to use people-pleasing behaviors, these individuals were aware of errors they made and tried to correct them if they could; liked to associate with others in both large and small groups; tried not to hurt other's feelings; and talked with others about their successes, failures, and frustrations. Overall they could transfer knowledge learned in one task to another task adequately and understood that if they did something wrong it would have an effect on something or someone else. Like individuals at the mild level of severity, MM individuals, functioned with their problems in both work and life situations; could be trained with standard instructional methods; and were able to solve most problems with peers effectively. However, like more severe individuals, MM's acquired information more effectively than they applied it and their problems affected other adaptive, learning, and job performance areas.

Individuals with moderate degrees of severity (M) relied on others for guidance, but made their own decisions unaided. These individuals appeared socially immature, often were bystanders in social and work situations, most of their social relationships were with younger persons, and they perceived themselves to have difficulties conveying their ideas to most people. In their work, MM's exhibited areas of weakness but not significant areas of strength. They had difficulty switching tasks, acquired new information better than they applied it, and required alternative training techniques (e.g., demonstration rather than verbal instructions or verbal instructions rather than demonstration) to learn. Common-place compensations (e.g., listing of tasks to be completed; talking through tasks before beginning them; collecting massive amounts of information before making a decision) appeared to enhance their job performance.

Individuals with moderate-to-severe degrees of severity (MS) relied on others to make decisions for them. These individuals were almost always bystanders in group situations and avoided making decisions or solving problems whenever possible. The effect of their problems were obvious in at least one or two other areas and they tended to rely on what strengths they had acquired to see them through. Interestingly, although they were poor at acquiring and storing information for future use, they applied the information they possessed well enough to get by in situations where they could not get others to solve their problems.

Individuals with severe degrees of severity (S) tended to need input from others to cope with almost every situation. These individuals needed to be pushed to participate, could not give straight answers to questions, were unable to cover their weaknesses, and exhibited a strange interaction pattern and sense of humor. At work they had difficulty tolerating disorganization or lack of clarity in directions given, took a long time getting back on task if interrupted, and didn't understand time limits and were frequently late or behind. They rarely anticipated cause and effect, became distraught or

depressed if routines were changed or modified, and neither acquired nor applied new information successfully. These individuals required highly specialized and radical training methods in order to learn and usually depended on compensatory mechanisms to help them perform (e.g., calculators, readers, or extreme environmental modifications). Interestingly, they exhibited superior areas of strengths in contrast to their major areas of weakness.

Subtype/Severities

When characteristics of subtypes and severities were analyzed, severity levels were found within each subtype. These subtype/severity groups were shown to be significantly different from one another (Chi-square = 44.208; sign. = .001). Unfortunately, when the total sample was broken into these groups, the N of each group was insufficient to reach the eigen value needed to conduct discriminant analyses among the groups and taxonomies could not be developed with confidence. Despite the lack of taxonomies, visual inspection of the raw data revealed interesting implications. Individuals with severe problems were not represented in the NLD or PD subtypes. Because NLDs are identified by their abilities in higher order cognition (measured by intelligence quotients) and PDs are identified by their abilities to sustain attention, the more likely severe individuals within these subtypes would be considered mentally retarded or behavior disordered. Severity levels with other subtypes represented a complete continuum and ratings of individual adaptive behavior items tended to group into patterns of mild, mild-to-moderate, moderate, moderate-to-severe, and severe VODs, NVODs, and GFDs. These visual inspections indicated that if sufficient numbers of individuals in each subtype/severity could be obtained, taxonomies for each could be empirically examined and described.

Implications

The present study has shown that, despite classifications by schools, not all individuals identified as learning disabled are. In addition, the results have shown that many individuals who have not been classified as learning disabled should have been. Therefore, the most basic implication of the present study is that rehabilitation counselors and specialists must conduct some assessment with individuals suspected of learning disabilities before concluding that they do or do not meet agency criteria.

When counselors have become familiar with their clients' behaviors, the subtype identifier and severity indicator can be used with confidence to determine subtype, severity, and subtype/severity. Collection of subtype information would suggest particular clusters of behaviors that are problematic and require specific or extensive diagnosis, indicate clients' strength and weakness patterns, and assist in appropriate requests for assessment instruments to be administered and interventions to be employed. Collection of severity information would ascertain adaptive abilities and disabilities of clients and the extent to which a client must rely on other people to succeed in social and work settings. Although the present study was not able to investigate severity/subtypes fully, it did indicate that consideration of the intellectual, achievement, and adaptive behavior characteristics of subtype/severities may be the foundation upon which decisions about training and career planning rests. When rehabilitation

counselors consider the implications of subtype/severity, as well as those of subtype and severity, for their clients, decisions can be made based on how and to what degree an individual can accept and succeed in any job; will require a selective, specialized job; will require job modification or job environment change; or will require on-site assistance to perform a job. From this information, positive changes in the development of individualized education programs and individualized written rehabilitation programs can be achieved for learning disabled adults.

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